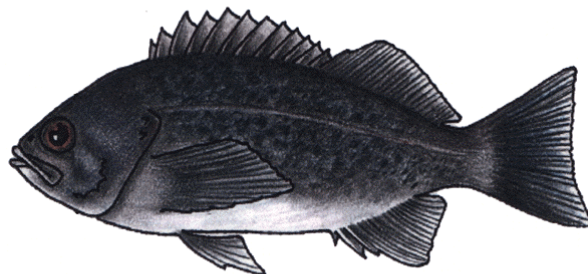


Blue Rockfish, *Sebastes mystinus*

1993-1999 Commercial Catch by Ports & Blocks



Marine Fishery Profiles

Volume 1: Nearshore

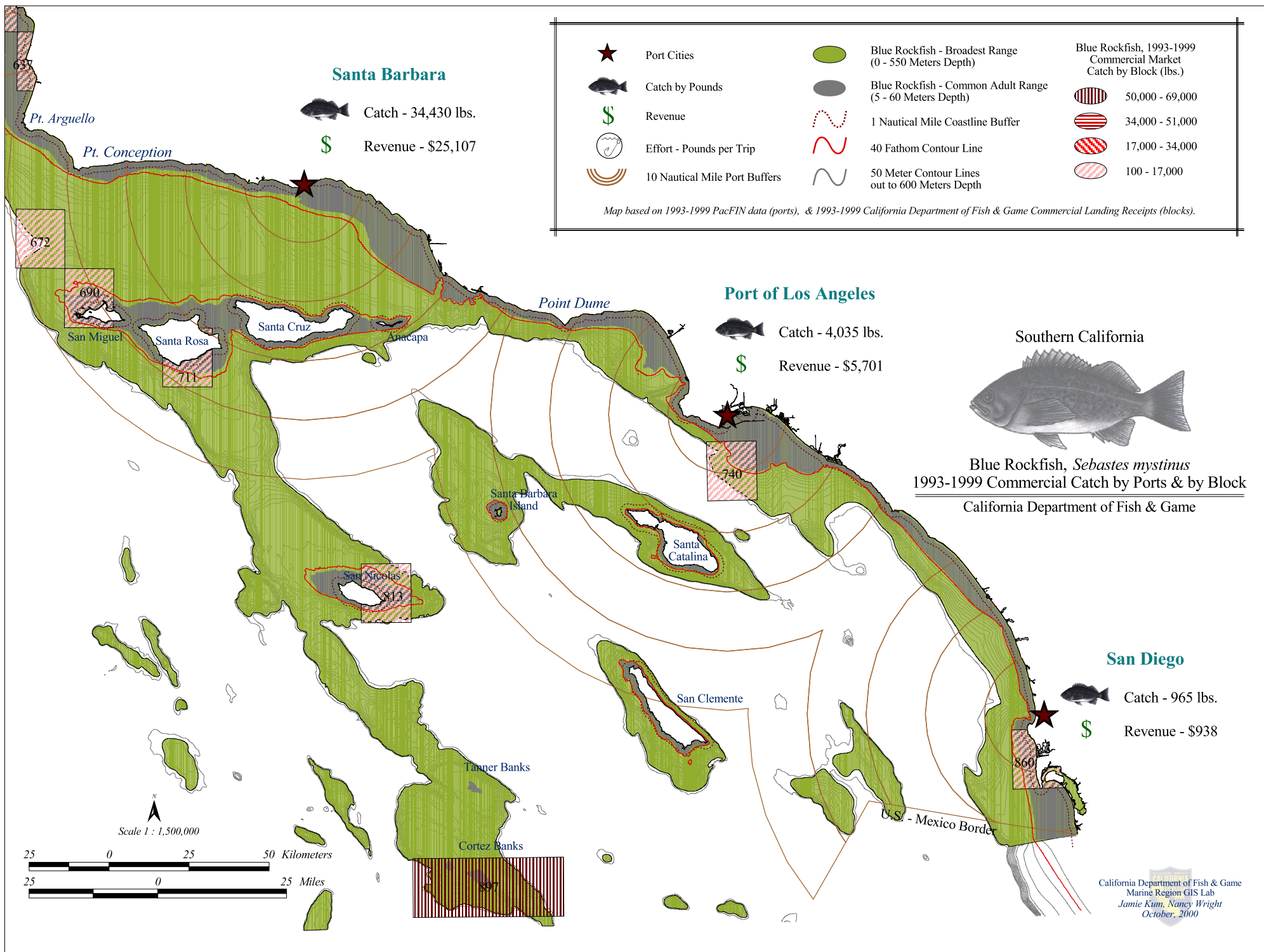
Marine Region GIS Lab

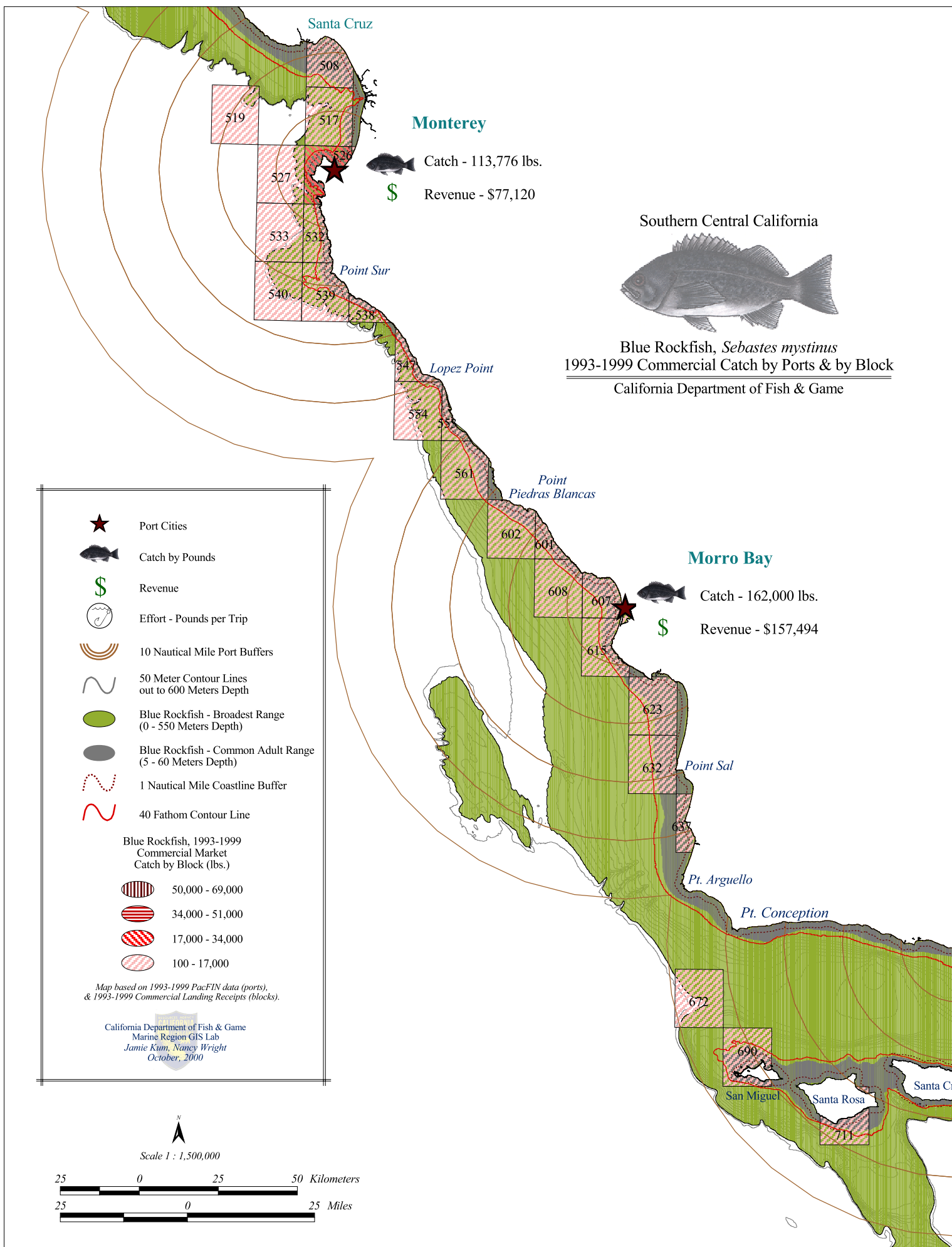
| | |
|--------------|----------------|
| Nancy Wright | Eric Knaggs |
| Jamie Kum | Bob Leos |
| Chad King | Colleena Perez |



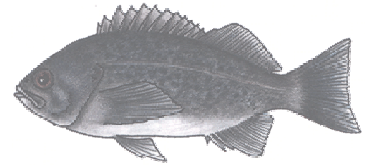
California Department of Fish & Game
Marine Region

December 2000





Northern Central California



Blue Rockfish, *Sebastes mystinus*
1993-1999 Commercial Catch by Ports & by Block
California Department of Fish & Game

Bodega Bay



Catch - 42,575 lbs.



Revenue - \$28,660

San Francisco



Catch - 92,887 lbs.



Revenue - \$74,839

Half Moon Bay

Santa Cruz

Monterey



Catch - 113,776 lbs.



Revenue - \$77,120

- ★ Port Cities
- Catch by Pounds
- \$ Revenue
- Effort - Pounds per Trip
- 10 Nautical Mile Port Buffers
- 50 Meter Contour Lines out to 600 Meters Depth
- Blue Rockfish - Broadest Range (0 - 550 Meters Depth)
- Blue Rockfish - Common Adult Range (5 - 60 Meters Depth)
- 1 Nautical Mile Coastline Buffer
- 40 Fathom Contour Line

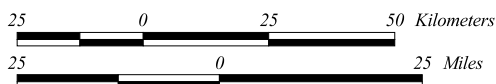
Blue Rockfish, 1993-1999
Commercial Market
Catch by Block (lbs.)

- 50,000 - 69,000
- 34,000 - 51,000
- 17,000 - 34,000
- 100 - 17,000

Map based on 1993-1999 PacFIN data (ports),
& 1993-1999 Commercial Landing Receipts (blocks).

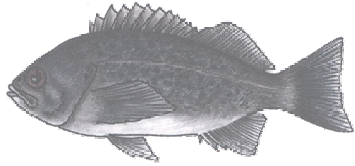
California Department of Fish & Game
Marine Region GIS Lab
Jamie Kum, Nancy Wright
October, 2000

Scale 1 : 1,500,000



Point
Piedras Blancas

Southern Central California



Blue Rockfish, *Sebastes mystinus* 1993-1999 Commercial Catch by Ports & by Block California Department of Fish & Game

- ★ Port Cities
- Catch by Pounds
- \$ Revenue
- Effort - Pounds per Trip
- 10 Nautical Mile Port Buffers
- 50 Meter Contour Lines out to 600 Meters Depth
- Blue Rockfish - Broadest Range (0 - 550 Meters Depth)
- Blue Rockfish - Common Adult Range (5 - 60 Meters Depth)
- 1 Nautical Mile Coastline Buffer
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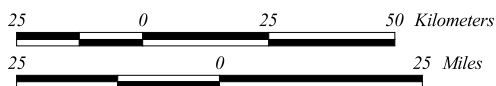
Blue Rockfish, 1993-1999
Commercial Market
Catch by Block (lbs.)

- 50,000 - 69,000
- 34,000 - 51,000
- 17,000 - 34,000
- 100 - 17,000

Map based on 1993-1999 PacFIN data (ports),
& 1993-1999 Commercial Landing Receipts (blocks).

California Department of Fish & Game
Marine Region GIS Lab
Jamie Kim, Nancy Wright
October, 2000

Scale 1 : 1,500,000



Crescent City



Catch - 271,150 lbs.



Revenue - \$143,642

Eureka



Catch - 152,358 lbs.



Revenue - \$77,010

Cape Menocino

Punta Gorda

Fort Bragg



Catch - 91,101 lbs.



Revenue - \$49,027

Point Arena

Figure 1. (refer to table 1) CDFG Commercial Receipts Data (1993 - 1999)
Total Pounds of Blue Rockfish Caught and Average Price per Pound by Month

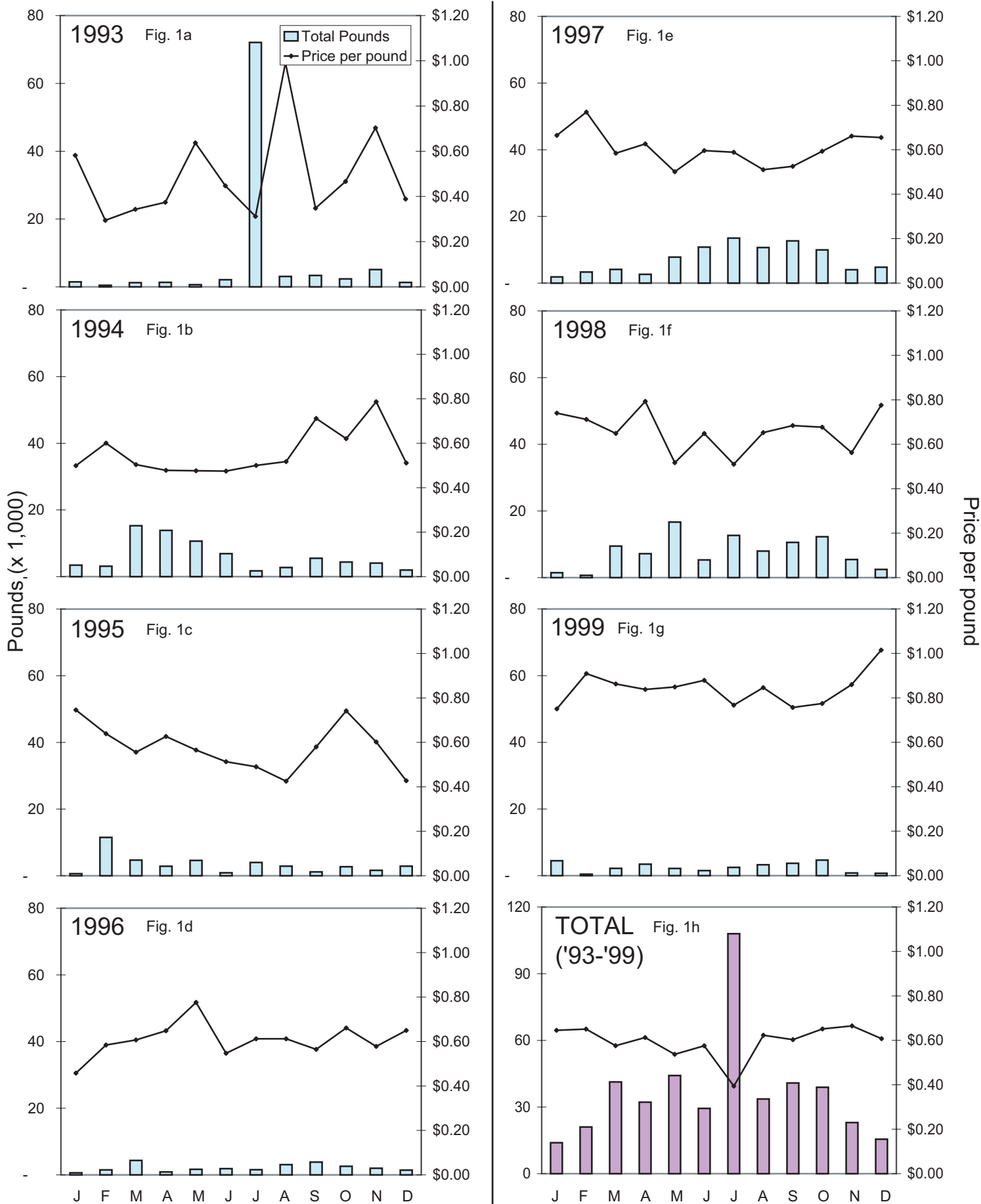


Table 1. (refer to fig. 1) CDFG Commercial Receipts Data (1993 - 1999)
Total Pounds of Blue Rockfish Caught and Average Price per Pound by Month

1993
Table 1a

| Month | Total Pounds | Price per Pound |
|--------------|---------------|-----------------|
| Jan | 1,468 | \$0.58 |
| Feb | 457 | \$0.29 |
| Mar | 1,236 | \$0.34 |
| Apr | 1,321 | \$0.37 |
| May | 637 | \$0.64 |
| Jun | 2,101 | \$0.45 |
| Jul | 72,076 | \$0.31 |
| Aug | 3,073 | \$0.99 |
| Sep | 3,362 | \$0.35 |
| Oct | 2,353 | \$0.47 |
| Nov | 5,092 | \$0.70 |
| Dec | 1,310 | \$0.39 |
| Total | 94,484 | \$0.37 |

1997
Table 1e

| Month | Total Pounds | Price per Pound |
|--------------|---------------|-----------------|
| Jan | 1,835 | \$0.66 |
| Feb | 3,329 | \$0.77 |
| Mar | 4,107 | \$0.58 |
| Apr | 2,635 | \$0.63 |
| May | 7,796 | \$0.50 |
| Jun | 10,783 | \$0.60 |
| Jul | 13,490 | \$0.59 |
| Aug | 10,668 | \$0.51 |
| Sep | 12,669 | \$0.53 |
| Oct | 9,962 | \$0.59 |
| Nov | 4,014 | \$0.66 |
| Dec | 4,773 | \$0.65 |
| Total | 86,060 | \$0.58 |

1994
Table 1b

| Month | Total Pounds | Price per Pound |
|--------------|---------------|-----------------|
| Jan | 3,453 | \$0.50 |
| Feb | 3,126 | \$0.60 |
| Mar | 15,259 | \$0.50 |
| Apr | 13,873 | \$0.48 |
| May | 10,654 | \$0.48 |
| Jun | 6,876 | \$0.47 |
| Jul | 1,729 | \$0.50 |
| Aug | 2,735 | \$0.52 |
| Sep | 5,495 | \$0.71 |
| Oct | 4,371 | \$0.62 |
| Nov | 4,056 | \$0.79 |
| Dec | 1,975 | \$0.51 |
| Total | 73,600 | \$0.53 |

1998
Table 1f

| Month | Total Pounds | Price per Pound |
|--------------|---------------|-----------------|
| Jan | 1,472 | \$0.74 |
| Feb | 688 | \$0.71 |
| Mar | 9,472 | \$0.65 |
| Apr | 7,178 | \$0.79 |
| May | 16,654 | \$0.52 |
| Jun | 5,319 | \$0.65 |
| Jul | 12,669 | \$0.51 |
| Aug | 7,952 | \$0.65 |
| Sep | 10,559 | \$0.68 |
| Oct | 12,263 | \$0.68 |
| Nov | 5,428 | \$0.56 |
| Dec | 2,457 | \$0.78 |
| Total | 92,110 | \$0.63 |

1995
Table 1c

| Month | Total Pounds | Price per Pound |
|--------------|---------------|-----------------|
| Jan | 622 | \$0.75 |
| Feb | 11,496 | \$0.64 |
| Mar | 4,698 | \$0.56 |
| Apr | 2,843 | \$0.63 |
| May | 4,607 | \$0.57 |
| Jun | 894 | \$0.51 |
| Jul | 3,980 | \$0.49 |
| Aug | 2,884 | \$0.43 |
| Sep | 1,155 | \$0.58 |
| Oct | 2,695 | \$0.74 |
| Nov | 1,613 | \$0.60 |
| Dec | 2,868 | \$0.43 |
| Total | 40,356 | \$0.58 |

1999
Table 1g

| Month | Total Pounds | Price per Pound |
|--------------|---------------|-----------------|
| Jan | 4,465 | \$0.75 |
| Feb | 431 | \$0.91 |
| Mar | 2,178 | \$0.86 |
| Apr | 3,445 | \$0.84 |
| May | 2,154 | \$0.85 |
| Jun | 1,535 | \$0.88 |
| Jul | 2,488 | \$0.77 |
| Aug | 3,259 | \$0.85 |
| Sep | 3,720 | \$0.76 |
| Oct | 4,675 | \$0.77 |
| Nov | 800 | \$0.86 |
| Dec | 723 | \$1.01 |
| Total | 29,872 | \$0.81 |

1996
Table 1d

| Month | Total Pounds | Price per Pound |
|--------------|---------------|-----------------|
| Jan | 607 | \$0.46 |
| Feb | 1,504 | \$0.58 |
| Mar | 4,337 | \$0.61 |
| Apr | 876 | \$0.65 |
| May | 1,662 | \$0.78 |
| Jun | 1,875 | \$0.55 |
| Jul | 1,556 | \$0.61 |
| Aug | 3,068 | \$0.61 |
| Sep | 3,835 | \$0.56 |
| Oct | 2,573 | \$0.66 |
| Nov | 1,985 | \$0.58 |
| Dec | 1,433 | \$0.65 |
| Total | 25,311 | \$0.61 |

TOTAL
'93 - '99
Table 1h

| Month | Total Pounds | Price per Pound |
|--------------|----------------|-----------------|
| Jan | 13,921 | \$0.65 |
| Feb | 21,031 | \$0.65 |
| Mar | 41,286 | \$0.58 |
| Apr | 32,170 | \$0.61 |
| May | 44,164 | \$0.54 |
| Jun | 29,384 | \$0.58 |
| Jul | 107,987 | \$0.39 |
| Aug | 33,639 | \$0.62 |
| Sep | 40,794 | \$0.60 |
| Oct | 38,890 | \$0.65 |
| Nov | 22,988 | \$0.66 |
| Dec | 15,539 | \$0.61 |
| Total | 441,794 | \$0.55 |

Figure 2. (refer to table 2) Pacific Fisheries Information Network Data (1993 - 1999)
Total Pounds of Blue Rockfish Caught and Average Price per Pound by Month

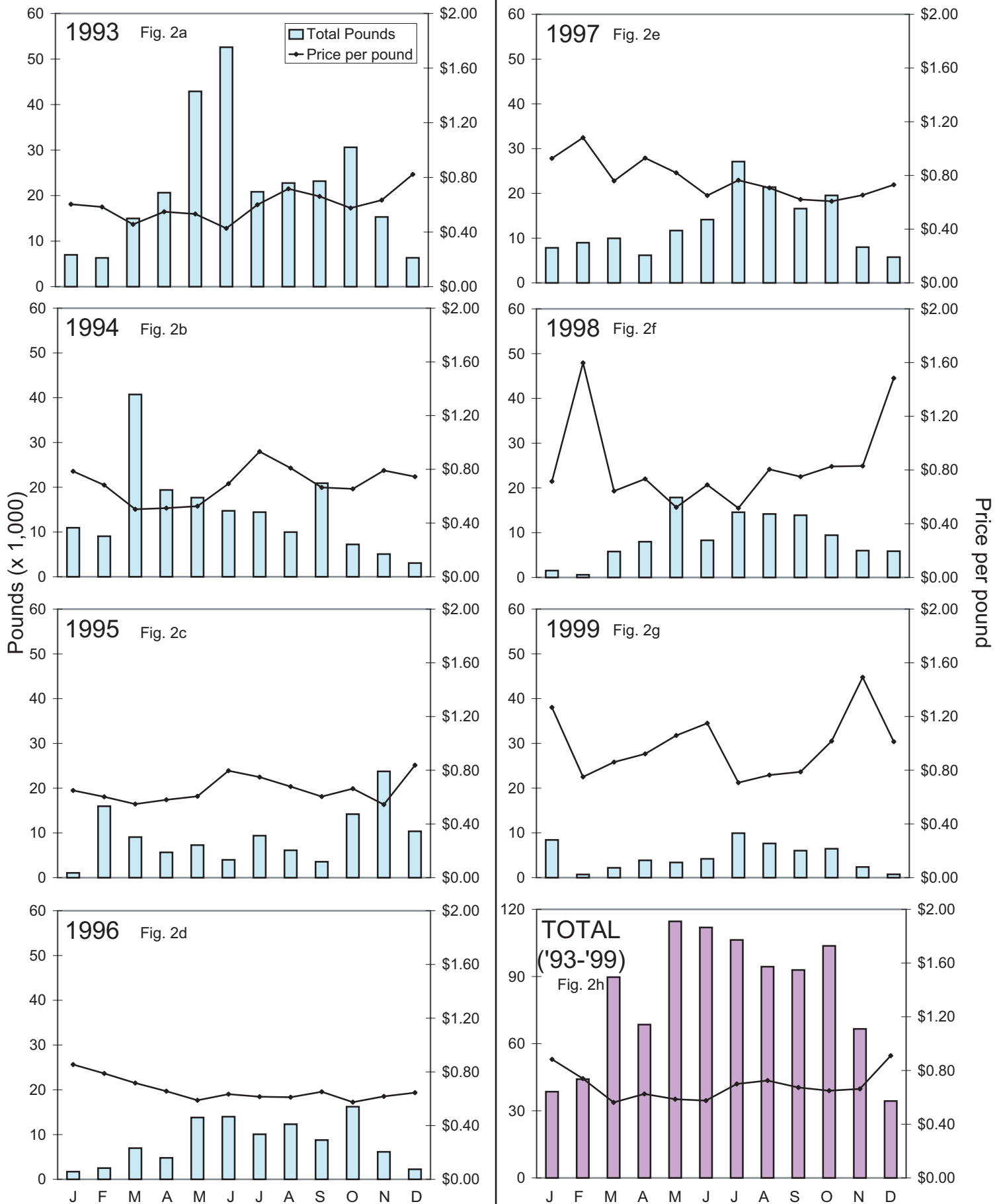


Table 2. (refer to fig. 2) Pacific Coast Fisheries Information Network Data (1993 - 1999)
Total Pounds of Blue Rockfish Caught and Average Price per Pound by Month

1993

Table 2a

| Month | Total Pounds | Price per Pound |
|--------------|----------------|-----------------|
| Jan | 7,003 | \$0.60 |
| Feb | 6,317 | \$0.58 |
| Mar | 14,980 | \$0.46 |
| Apr | 20,639 | \$0.55 |
| May | 42,892 | \$0.53 |
| Jun | 52,587 | \$0.43 |
| Jul | 20,837 | \$0.60 |
| Aug | 22,753 | \$0.72 |
| Sep | 23,176 | \$0.66 |
| Oct | 30,602 | \$0.58 |
| Nov | 15,305 | \$0.63 |
| Dec | 6,339 | \$0.82 |
| Total | 263,430 | \$0.56 |

1997

Table 2e

| Month | Total Pounds | Price per Pound |
|--------------|----------------|-----------------|
| Jan | 7,833 | \$0.93 |
| Feb | 8,968 | \$1.08 |
| Mar | 9,949 | \$0.76 |
| Apr | 6,172 | \$0.93 |
| May | 11,695 | \$0.82 |
| Jun | 14,144 | \$0.65 |
| Jul | 27,095 | \$0.76 |
| Aug | 21,384 | \$0.71 |
| Sep | 16,582 | \$0.62 |
| Oct | 19,535 | \$0.61 |
| Nov | 7,976 | \$0.65 |
| Dec | 5,752 | \$0.73 |
| Total | 157,085 | \$0.74 |

1994

Table 2b

| Month | Total Pounds | Price per Pound |
|--------------|----------------|-----------------|
| Jan | 10,953 | \$0.79 |
| Feb | 9,058 | \$0.68 |
| Mar | 40,721 | \$0.50 |
| Apr | 19,386 | \$0.51 |
| May | 17,679 | \$0.53 |
| Jun | 14,724 | \$0.69 |
| Jul | 14,424 | \$0.93 |
| Aug | 9,981 | \$0.81 |
| Sep | 20,896 | \$0.66 |
| Oct | 7,234 | \$0.65 |
| Nov | 5,062 | \$0.79 |
| Dec | 3,062 | \$0.75 |
| Total | 173,180 | \$0.64 |

1998

Table 2f

| Month | Total Pounds | Price per Pound |
|--------------|----------------|-----------------|
| Jan | 1,526 | \$0.71 |
| Feb | 596 | \$1.60 |
| Mar | 5,786 | \$0.64 |
| Apr | 7,984 | \$0.73 |
| May | 17,868 | \$0.52 |
| Jun | 8,290 | \$0.69 |
| Jul | 14,560 | \$0.52 |
| Aug | 14,184 | \$0.81 |
| Sep | 13,901 | \$0.75 |
| Oct | 9,439 | \$0.83 |
| Nov | 5,991 | \$0.83 |
| Dec | 5,858 | \$1.48 |
| Total | 105,983 | \$0.73 |

1995

Table 2c

| Month | Total Pounds | Price per Pound |
|--------------|----------------|-----------------|
| Jan | 1,064 | \$0.65 |
| Feb | 15,969 | \$0.60 |
| Mar | 9,077 | \$0.55 |
| Apr | 5,651 | \$0.58 |
| May | 7,276 | \$0.61 |
| Jun | 3,976 | \$0.80 |
| Jul | 9,379 | \$0.75 |
| Aug | 6,125 | \$0.68 |
| Sep | 3,553 | \$0.60 |
| Oct | 14,185 | \$0.66 |
| Nov | 23,748 | \$0.54 |
| Dec | 10,364 | \$0.84 |
| Total | 110,367 | \$0.64 |

1999

Table 2g

| Month | Total Pounds | Price per Pound |
|--------------|---------------|-----------------|
| Jan | 8,421 | \$1.27 |
| Feb | 697 | \$0.75 |
| Mar | 2,202 | \$0.86 |
| Apr | 3,876 | \$0.92 |
| May | 3,388 | \$1.06 |
| Jun | 4,198 | \$1.15 |
| Jul | 9,937 | \$0.71 |
| Aug | 7,629 | \$0.76 |
| Sep | 6,036 | \$0.79 |
| Oct | 6,459 | \$1.02 |
| Nov | 2,374 | \$1.49 |
| Dec | 730 | \$1.01 |
| Total | 55,947 | \$0.96 |

1996

Table 2d

| Month | Total Pounds | Price per Pound |
|--------------|---------------|-----------------|
| Jan | 1,709 | \$0.85 |
| Feb | 2,509 | \$0.79 |
| Mar | 6,969 | \$0.72 |
| Apr | 4,794 | \$0.66 |
| May | 13,812 | \$0.59 |
| Jun | 13,988 | \$0.63 |
| Jul | 10,073 | \$0.62 |
| Aug | 12,322 | \$0.61 |
| Sep | 8,776 | \$0.65 |
| Oct | 16,221 | \$0.57 |
| Nov | 6,142 | \$0.62 |
| Dec | 2,251 | \$0.65 |
| Total | 99,566 | \$0.63 |

TOTAL
'93 - '99

Table 2h

| Month | Total Pounds | Price per Pound |
|--------------|----------------|-----------------|
| Jan | 38,509 | \$0.88 |
| Feb | 44,114 | \$0.74 |
| Mar | 89,684 | \$0.56 |
| Apr | 68,502 | \$0.63 |
| May | 114,610 | \$0.59 |
| Jun | 111,907 | \$0.58 |
| Jul | 106,305 | \$0.70 |
| Aug | 94,378 | \$0.73 |
| Sep | 92,920 | \$0.67 |
| Oct | 103,675 | \$0.65 |
| Nov | 66,598 | \$0.66 |
| Dec | 34,356 | \$0.91 |
| Total | 965,558 | \$0.66 |

Abbreviated Life History of Blue Rockfish (*Sebastes mystinus*)

The blue rockfish is a medium-sized, midwater rockfish important in both the recreational and commercial catches in California, and it is the most abundant rockfish in central California kelp beds.

Distribution, Stock Structure and Migration

Blue rockfish range from the Bering Sea to Punta Banda, Baja California, and from surface waters to a maximum depth of 1800 feet. They are less common south of the northern Channel Islands and north of Eureka, California.

It is believed that the last exceptionally strong year class of blue rockfish in central California occurred in 1988.

No information is available regarding genetically discernable substocks of blue rockfish.

Movement and migration studies of blue rockfish have determined them to be residential. Most authors report movement of less than 6 miles. In addition, tagging studies of adult blue rockfish indicate they do not migrate laterally along the coast. While studies show adult blue rockfish populations are more or less discreet at each fishing port, it is not known how much larval drift occurs between fishing areas.

Age and Growth

Blue rockfish, sex unspecified, have been aged to a maximum of 24 yr using scales or otoliths. Rockfishes in general are considered to be slow-growing fishes. However, blue rockfish are among the faster growing rockfishes. First year growth may vary from 3.0 to 4.5 in., and after 2 yr blues may reach 6 inches. Anglers may catch an occasional 2- or 3-yr old blue rockfish, but most do not recruit to the sport and commercial fisheries until 4 to 7 yr of age when they range from 8 to 10 inches. Females grow at a slightly faster rate than males.

Reproduction, Fecundity and Seasonality

Age at first maturity for males has been found to vary between 3 yr (7.5 in. TL) and 4 yr (9.0 in. TL). For females, age at first maturity has been found to vary between 2 yr and 5 yr (10 in. TL). Age at 50% maturity for males has been found to vary between 3 yr and 7 yr (10.2 in. TL). For females, age at 50% maturity has varied from 4 yr to 6 yr (11.4 in. TL).

Studies in central California have shown that in males the

gonads increase in size from May to July, but in females the eggs begin maturing from July to October. Mating takes place in October, but the embryos do not begin to develop until December when the eggs are fertilized by the stored sperm. Embryos develop within the female and hatch immediately upon being released into water; larval release usually peaks in mid-January.

Blue rockfish are thought to spawn once a year. Larvae are planktonic for four to five months, where they may be carried many miles by ocean currents. Young-of-the-year (YOY) blue rockfish begin to appear in the kelp canopy and shallow rocky areas by late April or early May when they are about 1.2 to 1.4 in. in length.

Natural Mortality

The instantaneous rate of natural mortality (M), has been reported as averaging 0.006, with a range of 0.001 to 0.008, using catch curve analysis.

Diseases

No information on disease in blue rockfish was found.

Predator/Prey Relationships

Feeding habits vary considerably depending upon life history stage, depth, and locality. As larvae, blue rockfish are planktivorous and are known to feed on nauplii and invertebrate eggs as well as copepods. As adults they remain primarily planktivorous and are considered to be omnivorous/zooplanktivorous. They feed on jellyfish, tunicates, thaliaceans, algae, small crustaceans, and small fish.

Adults are subject to predation by other rockfish, lingcod, sharks, dolphins, seals, sea lions, and possibly river otters. Juveniles fall prey to other rockfishes, lingcod, cabezon, salmon, marine birds and porpoises.

Competition

Blue rockfish are commonly associated with other nearshore fish species, particularly other rockfishes. In a broad area along the entire Monterey Peninsula extending out to 240 feet deep, blue rockfish were the predominant species and were in close association with olive, yellowtail, starry, and rosy rockfishes.

Critical Habitat

Larval blue rockfish are pelagic. In the spring, YOY begin to appear in the kelp canopy, shallow rocky areas and nearshore sand-rock interface. Adults inhabit the midwater and pelagic

areas around high-relief rocky reefs, within and around the kelp canopy and around artificial reefs. They are common in kelp beds, where food is plentiful and protection from predators is provided. In the kelp beds, they form both loose and compact aggregations.

Status of Stocks

Commercial and recreational fishery sampling seem to suggest that while blue rockfish have withstood considerable fishing pressure over the last four decades, the stock continues to be healthy. They are one of the most important recreational species in California for anglers fishing from skiffs and Commercial Passenger Fishing Vessels, and is usually the most frequently caught rockfish north of Point Conception. This species truly has been the bread and butter of the nearshore recreational angler in northern and central California.